

PSYCHOLOGY 305

COGNITIVE PROCESSES

Topics for Week 9: Social cognition (p559-586, 592-595)

1. Intro
2. Orbitofrontal cortex
3. mPFC

Social Norm

Dress Code by VanzKantDanz



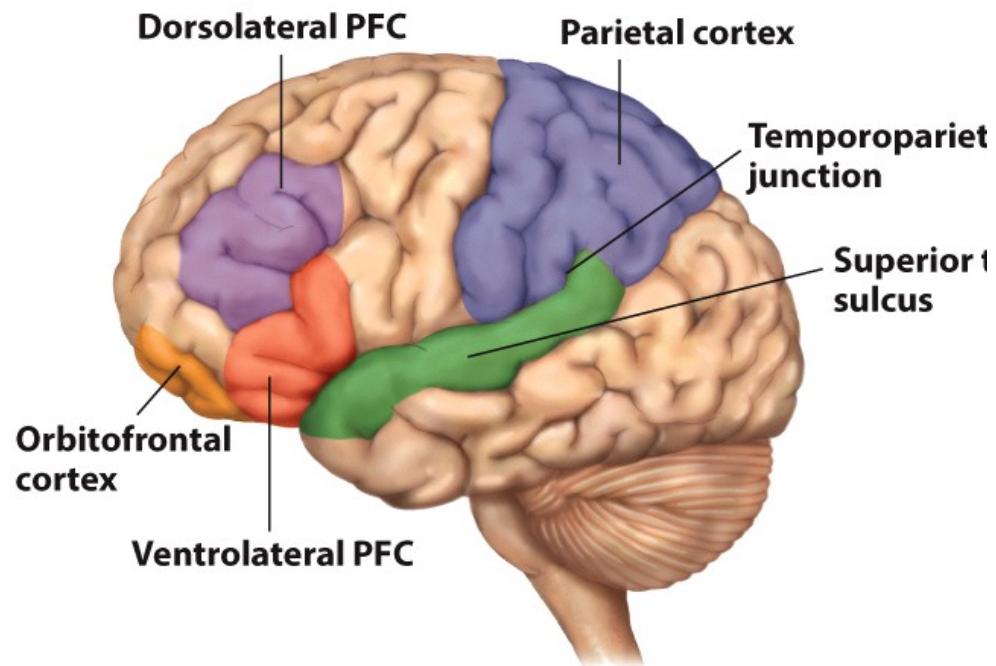
“Better than average effect” (BTAE)

- Prisoners believe they have more pro-social characteristics – such as kindness, morality, self-control, and generosity – than non-prisoners
- Rated themselves as equally law abiding to non-prisoners



Social Cognitive Neuroscience

- Important to understand
 - Social norm and compliance to social norm
 - BTAE
- Monitoring the social appropriateness of our own behaviour.
 - Orbitofrontal cortex



Phineas Gage (1848)

- A responsible railroad foreman
- In an accident, a tamping iron pierced his skull, going through orbitofrontal cortex.
- Big personality change, can't hold jobs, lost ambition, socially inappropriate behavior (impulsive).
- “irreverent, indulging in the grossest profanity, manifesting little deference to his fellows, impatient of restraint or advice when it conflicts with his desires” (Harlow, his physician)
- “intolerable to decent people”
- **Unable to evaluate and control his own social behaviors**



Contemporary Phineas Gage



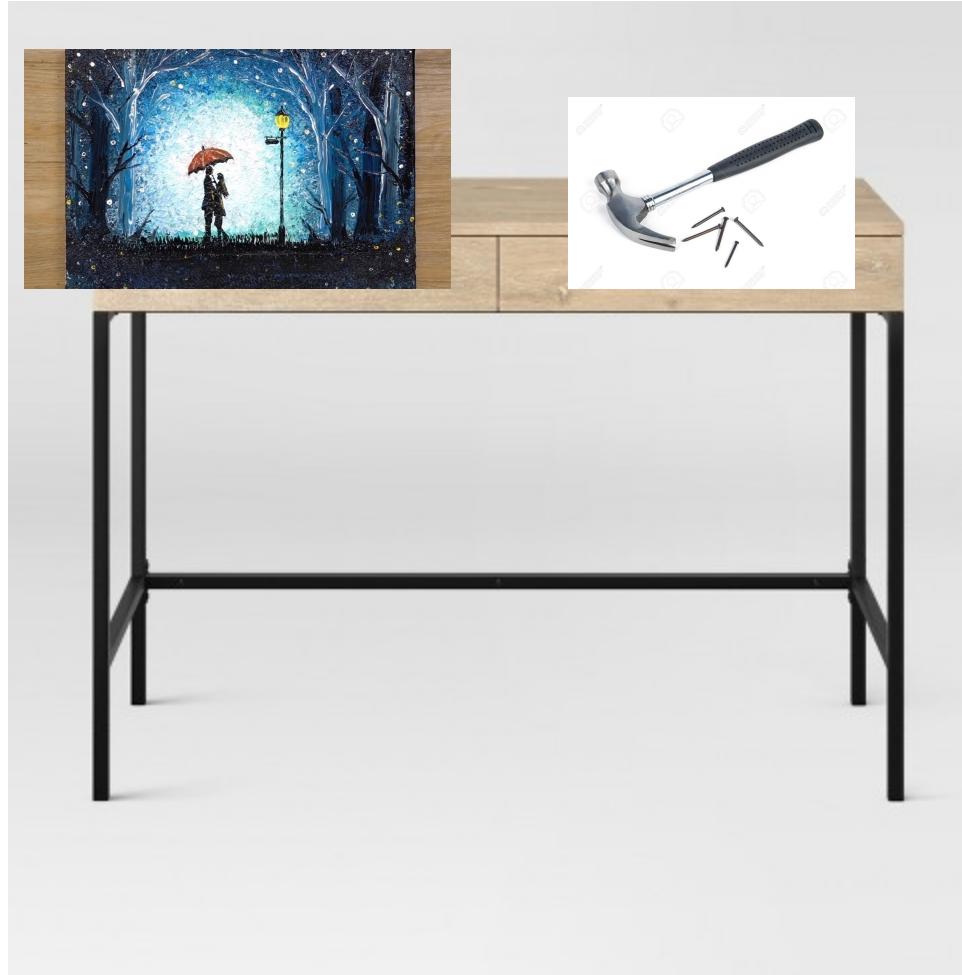
Brain and Behavior:
A Contemporary
Phineas Gage

Patient MR

- Also has damage to orbital frontal cortex.
- Normal memory, language, and motor skills.
- Inappropriate social behavior such as discussing personal life with strangers.
- **Deficits in interpreting the meaning of social cues.**

Cases with PG & MR suggest a specific neural network devoted to social cognition (a “social brain”)

Social context and “utilization behavior”



Social context and “utilization behavior”

- Lhermitte: French physician studies orbital frontal patients.
- Finds that when they see hammer, nail, and picture on entering office, put up the picture with hammer and nail.
- Thus, they have “utilization behavior,” can’t regulate social appropriateness.
- Also exhibit inappropriate imitative behavior.

A Social Norm Issue: oversharing



Mama Susan

I was giving Emma-monster a bath just now when what did I find floating in the bottom of the bathtub? You guessed it! Poop! Ewwww! Mama had to pick up the 6 little brown nuggets with her bare hands. Oh, the joys of motherhood! :-0

13 hours ago · Like · Comment

16 people like this

You must be confused...It seems you have your facebook status mixed up with your diary again.



som eecards
TMI card



THE BLOG



Grown And Flown

Authors, Goldman Sachs: The Culture of Success

GET UPDATES FROM GROWN AND FLOWN
 344

Oversharing: Why Do We Do It and How Do We Stop?

The Real Reason Why So Many People Overshare

Social norm experiment

- Questionnaire survey
- Experimenter asks questions
- Self-evaluate from memory
- Self-evaluate when watching themselves



Damage to the orbitofrontal cortex

Four Tasks:

1. Social norms questionnaire
2. Experimenter asks personal questions that are not usually discussed with strangers
3. Self-evaluation of how appropriate previous answers were
 - “I tried to keep many of my thoughts and feelings to myself while answering the questions “
4. Report change in emotion based on video of conversation

Results:

1. Knowledge of social norms
2. Judges ranked their answers as being more inappropriate
3. Patients over-estimated appropriateness of own answers
 - Lack of self-awareness or self-monitoring in social situations.
 - Therefore do not correct behavior.
4. Showed increased embarrassment after watching video of interaction
 - Lack immediate insight but can observe it as if they are another person.

DENNIS THE MENACE

BY HANK KETCHAM

10-30



"WHAT DO YA MEAN? I'VE GOT PLENTY OF
MANNERS. I JUST CHOOSE NOT TO USE 'EM."

Orbitofrontal cortex and recognition of social norms

- Faux pas task
- Story:
 - Anne received a vase from Sarah as a wedding gift . A year later Sarah broke the vase. Anne told Sarah not to worry because she never liked it...
- OFC patients understand that Sarah felt bad, but did not understand that Anne was trying to make Sarah feel better.
 - Failed to take context into social reasoning.

Table 14.1 Types of Errors

Group Tested	Detected Faux Pas
DFC patients	
L.S.	10
R.T.	10
O.A.	10
W.E.	10
Mean	10
OFC patients	
D.H.	9
M.R.	6
R.V.	7
R.M.	8
R.B.	10
Mean	8
Anterior temporal control	
B.G.	10
Normal controls	
Mean	10

Source. From Stone et al., 1998.

Orbitofrontal cortex and learning social norms

- OFC may be necessary for *learning* and using new social knowledge.
 - In normal subjects, OFC is more engaged when subjects are trying harder to comply with social norms (Spitzer et al., 2007).
 - Children with orbitofrontal damage never learn social rules (in contrast to adults who cannot apply known rules).

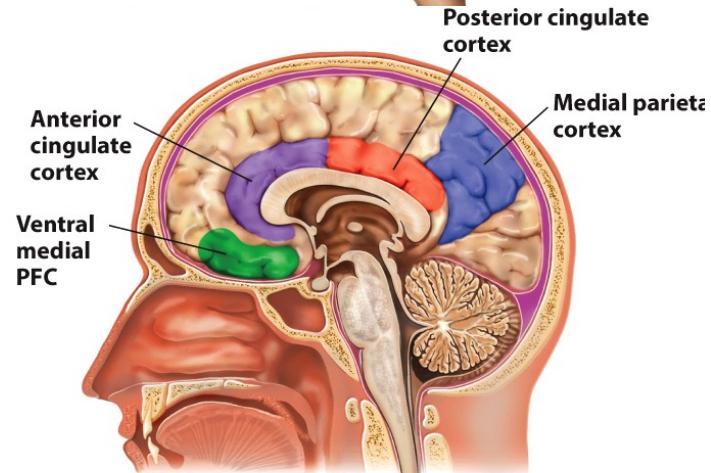
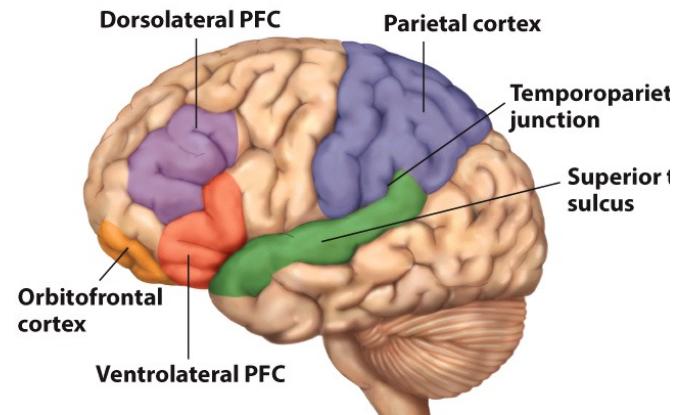


OFC summary

- OFC important for on-line monitoring of own social appropriateness.
 - Applying social knowledge to decisions in social or emotional context.
- OFC may be necessary for learning and applying social norms.
- But, not necessary for representing knowledge of social rules, after they have been acquired.

Social Cognitive Neuroscience

- Important to understand
 - Social norm and compliance to social norm
 - BTAE
- Monitoring the social appropriateness of our own behavior.
 - Orbitofrontal cortex
- How we reference and think about ourselves
 - Medial prefrontal cortex
- How we think about others' emotions, thoughts, etc. (theory of mind)
 - Medial prefrontal cortex



Self-referential processing



- Self-referent effect:
We are more likely to remember the adjective “happy” if we judge how well it describes ourselves vs. how well it describes the president.

The self-referent effect: Thinking about ourselves

Word list:

HAPPY

Thoughtful

Radical

Kind

Silly

Funny

Sad

Thoughtful

Caring

Kind

Good

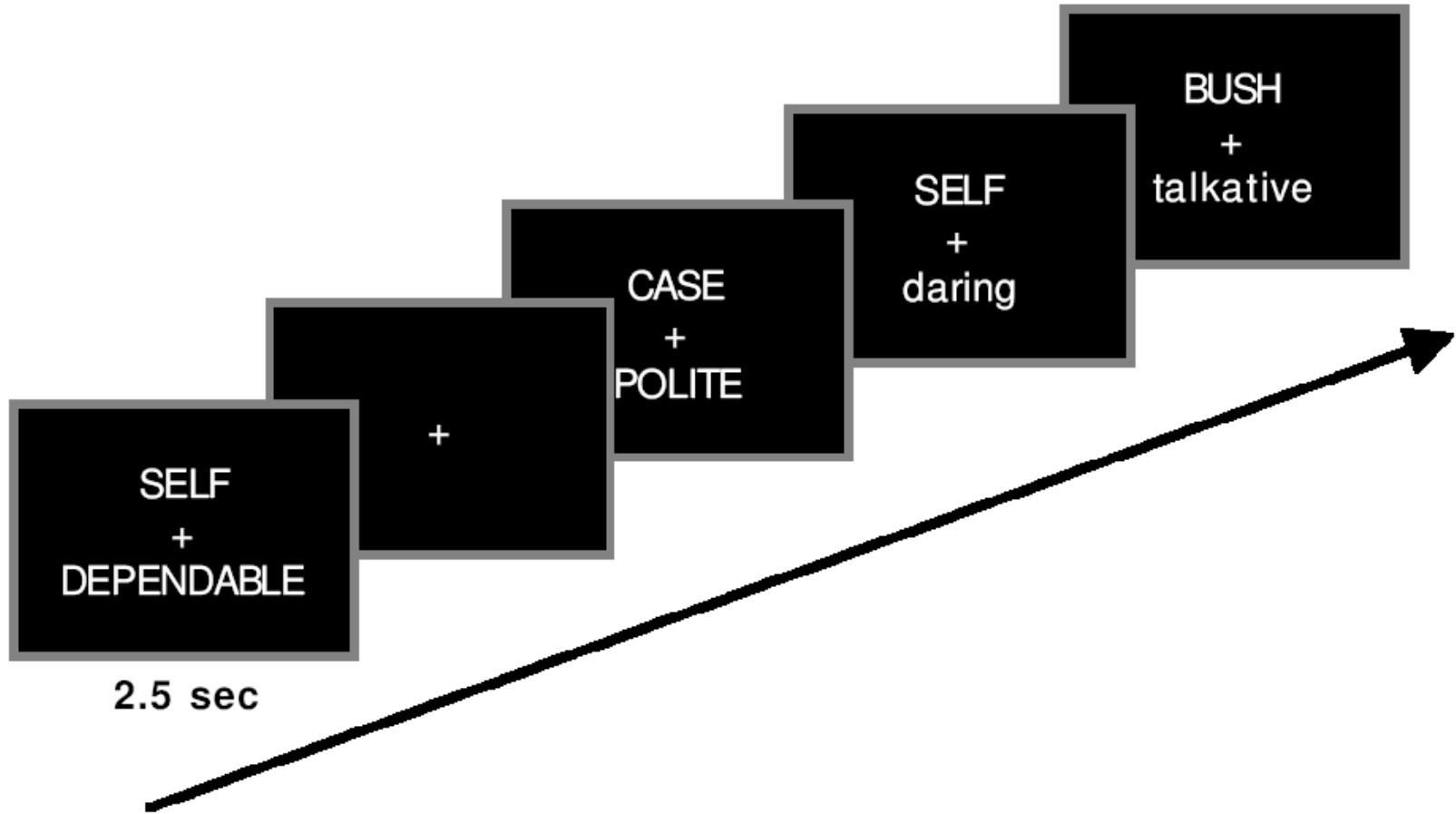
Funny

- Task context:
 - “Does this word describe you?”
 - “Does this word describe the current president?”
 - “What font is this word written in?”
- Memory test: word old/ new?
- Result: Better memory for words seen in the context of self

Why are we better at remembering self-referential information?

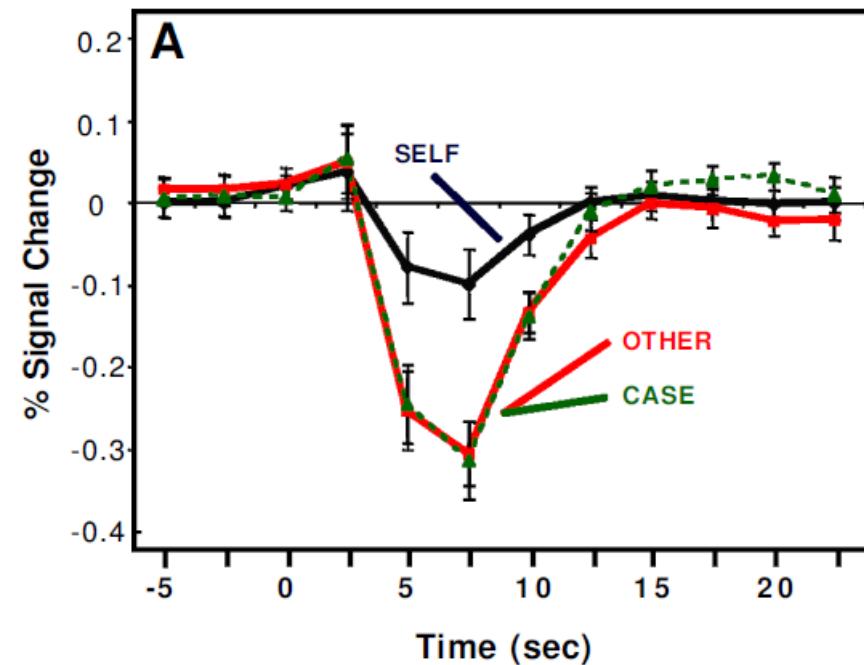
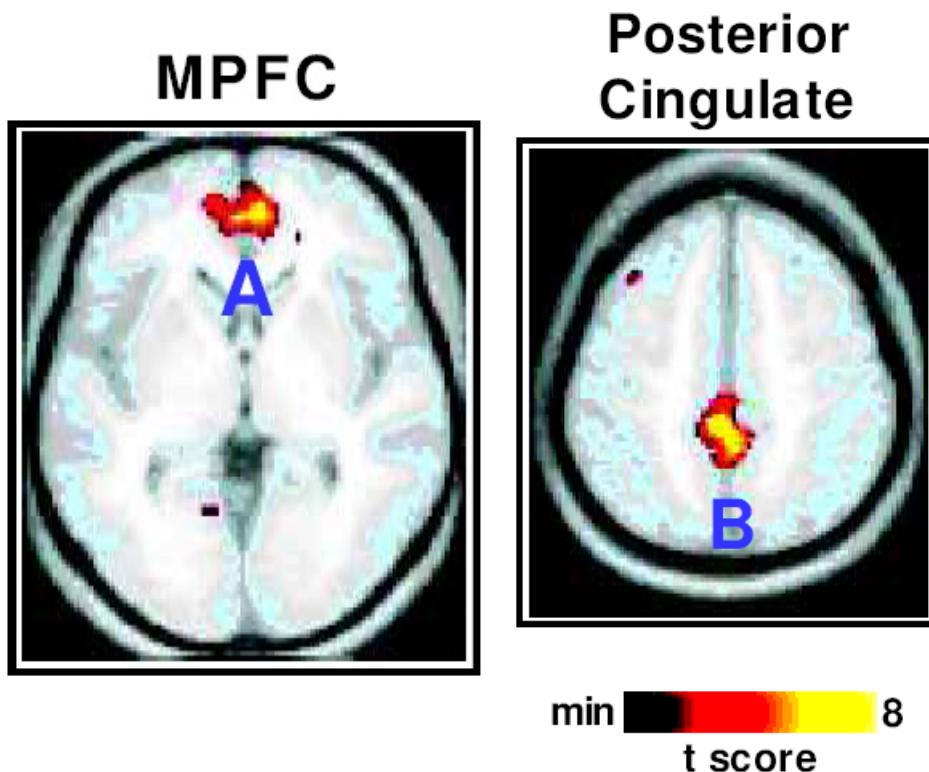
- 1. Depth of processing (Craik and Lockhart, 1972)
 - memory for information depends on the depth of processing involved during encoding
 - e.g. evaluating the meaning of “happy” as opposed to the font during encoding.
 - Information related to the self is always processed at the deepest level (Markus, 1977; Rogers et al., 1977):
- 2. Information about the self is encoded in separate/special system or by different processes than other information that leave stronger memory traces.

How to find self in the brain?



Kelley et al. JCN 14, 785-704, 2002; consider yourself, president Bush, or case of letters used to write the word (neutral condition).

Where is the self in the brain?



Relating adjectives to oneself rather than to others or paying attention to word form leads to stronger activations of medial pre-frontal cortex (mPFC) and PCC

mPFC and TOM

One of the two tasks

- Make an impression of that person's personality based on the statement about an action
 - Requires ability to infer something about the person's internal state (e.g. loves to show-off; is carefree).
- To remember person in sequence with other people.
- Dorsomedial PFC activation
 - Higher for impression formation
 - Lower for sequencing task
 - No activation for forming impression of inanimate things.



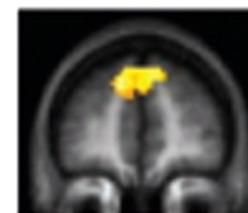
"At the party, he was the first to start dancing on the table."



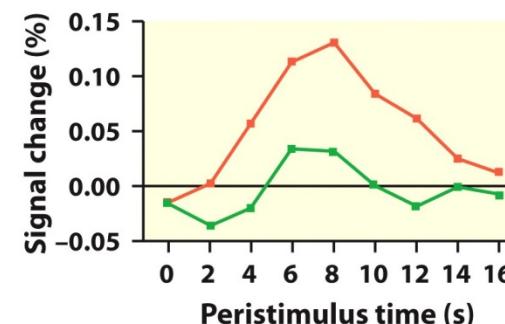
"He refused to lend his extra blanket to the other campers."



x = 6



y = 51



Red=impression formation

Green=remembering picture sequencing

Theory of Mind (ToM) or Mentalizing

- The ability to think about others (“putting yourself in other's shoes”)
 - make inferences about others
 - predict the mental states of others
- Critical for a wide range of social interactions, such as cooperating, empathizing and accurately predicting the behavior of others

mPFC and thinking about others

- Simulation theory
 - our understanding of other's intentions or thoughts is based on a simulation of our own intentions or thoughts (mirror systems)
- For mPFC then, perhaps we use mechanisms of self-perception to make inferences about other's motivations.

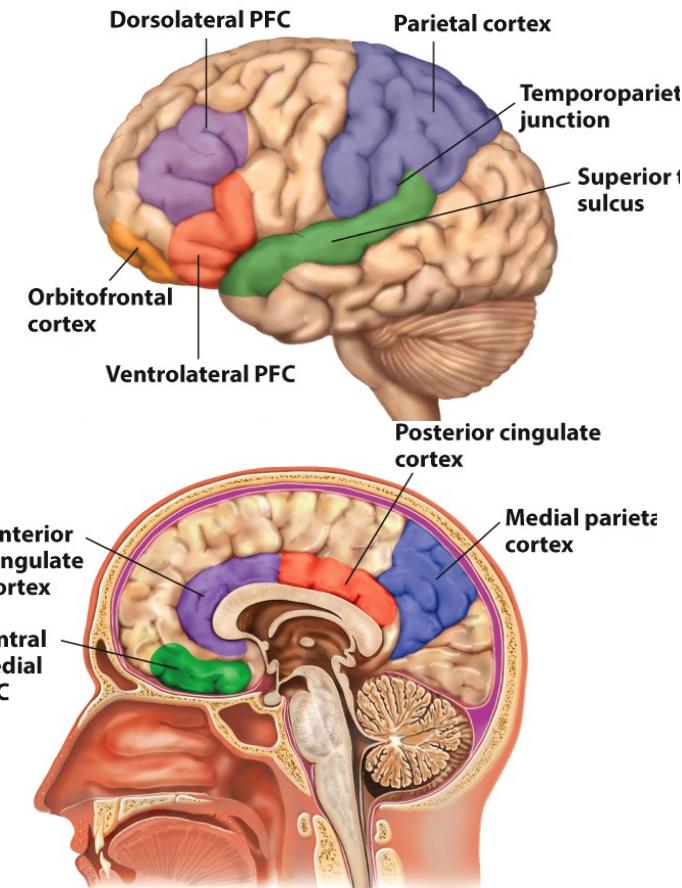


mPFC summary

- We think we're special and thinking about ourselves is special.
 - This activates MPFC
- MPFC also activated when we infer the personality (try to understand actions) of others
 - but, maybe really still thinking about ourselves (simulation theory).
- A dedicated center for “social self”
- Also use this center to think of others

Social Cognitive Neuroscience

- Important to understand
 - Social norm and compliance to social norm
 - BTAE
- Monitoring the social appropriateness of our own behavior
 - Orbitofrontal cortex
- How we reference and think about ourselves
 - Medial prefrontal cortex
- How we think about others' emotions, thoughts, etc. (theory of mind)
 - Medial prefrontal cortex



Player A has 100MU and player B doesn't

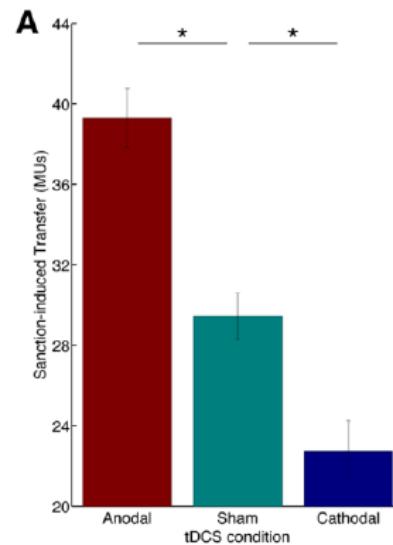
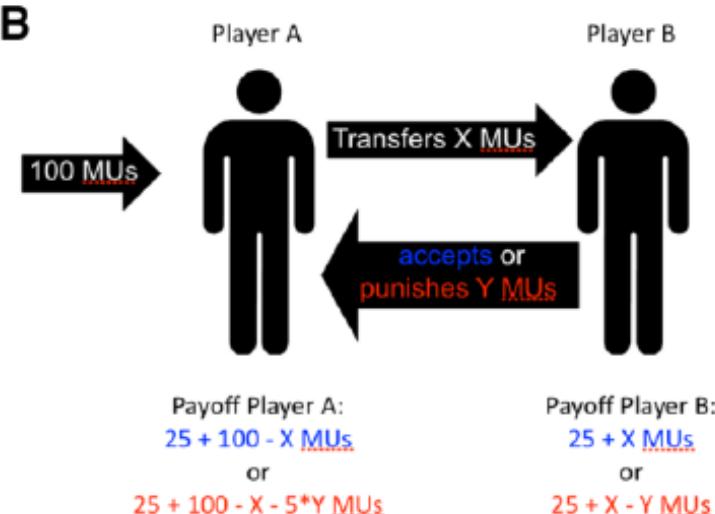
1. Player A can transfer money to B
 1. ~10MU on average
2. Now B can punish A
 1. ~30MU on average

Stimulation will change how much money is given in task #2

Social norm & rLPFC

Another social norm: Equality and Fairness

Fairness norm: to split the “cake” equally between both players.



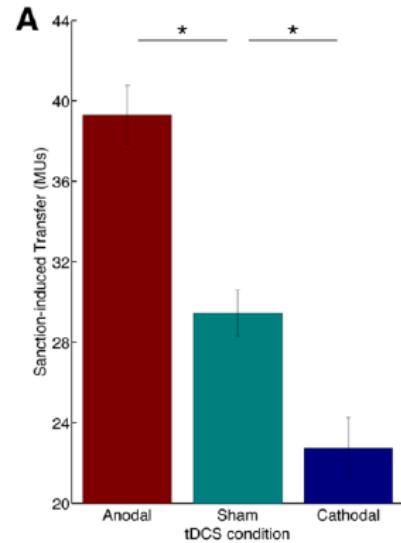
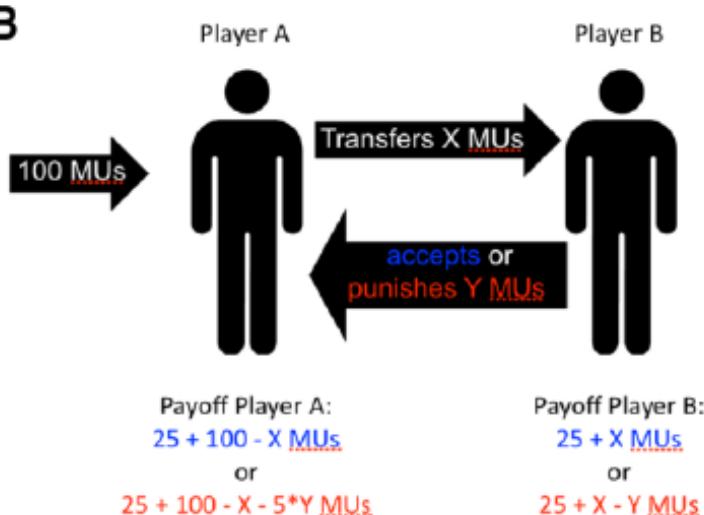
Participants transferred more money after positive (anodal) tDCS and less money after negative tDCS

tDCS on right lateral prefrontal cortex (rLPFC) improves conformation to Fairness Norm

Social norm & rLPFC

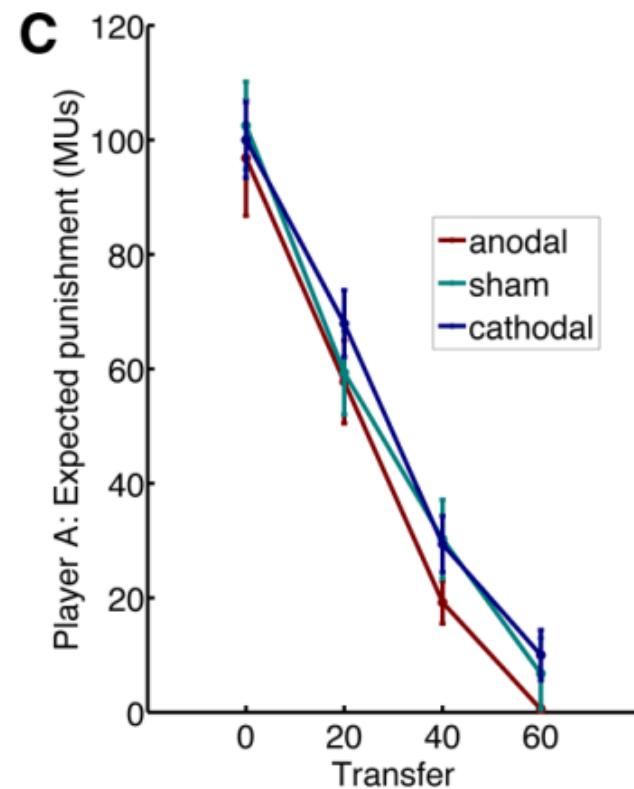
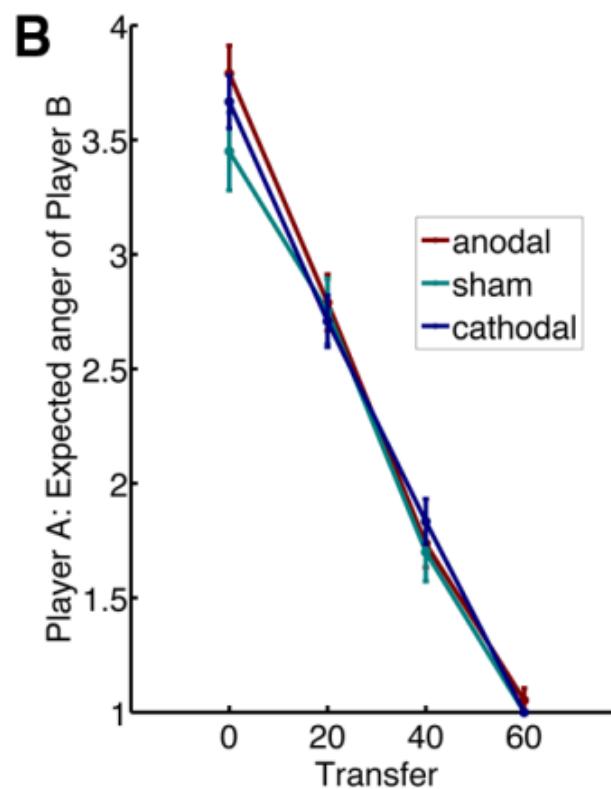
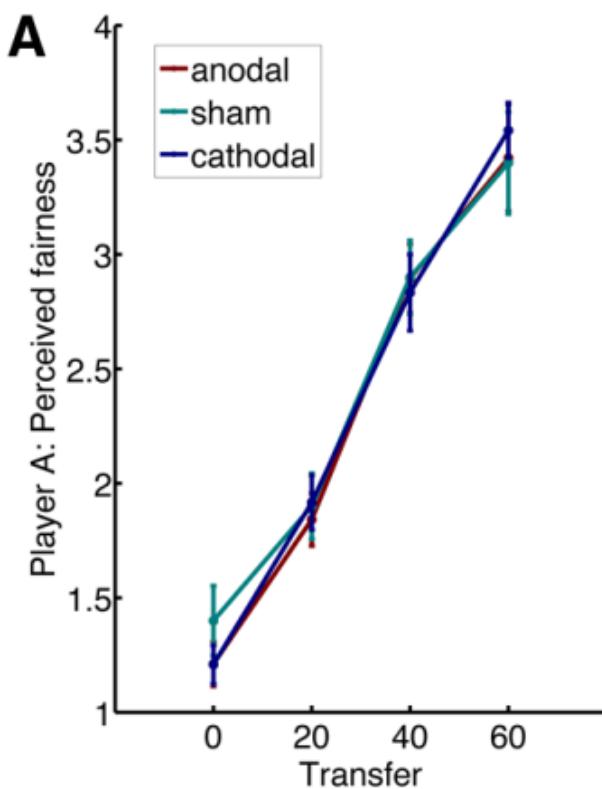
Possible confounds:

- beliefs about the fairness
- anticipated anger in player B
- expected punishment from player B



tDCS on right lateral prefrontal cortex (rLPFC) improves conformation to Fairness Norm

- rLPFC stimulation does not affect participants' beliefs about the fairness of different transfers and about player B's anticipated anger and expected punishment.



Essentials

- Patient MR and Phineas Gage: what they says about brain and social behavior.
- Social knowledge and orbital frontal damage.
- Self- referential processing
 - Self & MPFC
 - Understanding others (theory of mind) & MPFC.
- Fairness and rIPFC